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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

TUNG, TA HSUNG

ART UNIT PAPER NUMBER

1753

DATE MAILED: 10/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/098,730

Applicant(s)
SUGIYAMA ET AL

Examiner
T. TUNG

Group Art Unit
1753

Paper No. 38

— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☒ R sponse to communication(s) filed on 8/19/03, 9/11/03

☐ This action is FINAL

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

☒ Claim(s) 1, 2, 4, 6, 7, 10, 11, 18-22, 24-29

is/are pending in the application.

Of the above claim(s)

is/are withdrawn from consideration.

☐ Claim(s)

is/are allowed.

☒ Claim(s) 1, 2, 4, 6, 7, 10, 11, 18-22, 24-29

is/are rejected.

☐ Claim(s)

is/are objected to.

☐ Claim(s)

are subject to restriction or election requirement

Application Papers

- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. _____.

☐ Copies of the certified copies of the priority documents have been received

in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

☒ Information Disclosure Stat ment(s), PTO-1449, Paper N (s) _____

☐ Interview Summary, PTO-413

☒ Notice of Ref rence(s) Cited, PTO-892

☐ Notice of Informal Patent Application, PTO-152

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Oth r _____

Office Action Summary

Art Unit: 1102

Claims 1, 2, 4, 6, 7, 10, 11, 18-22 are rejected on the ground of res judicata.

These claims are identical to the claims affirmed on appeal, and applicant is not entitled to further adjudication on the same record.

The record is believed to be essentially the same as that before the Board of Appeals, since the two newly-cited articles (Hamano et al and Yokota et al) are not seen to support applicant's position in any manner. Even if applicant's proffer that the articles show the particle size of the starting material to be smaller than the sintered particle size were true (and that is not conceded), it is unclear how that supports his position. If applicant continues to rely upon these articles, he is called upon to point out the portions of the translations by page and line how the articles buttress his point.

Claims 1, 2, 4, 6, 7, 10, 11, 18-22, 26, 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mase et al 4,861,456 in view of Suzuki et al 4,177,112.

Mase discloses an alumina layer 54 sandwiched by an insulating layer 50 and an electrolyte layer 28, an alumina layer 34 sandwiched by electrolyte layers 8 and 10. The alumina layers are porous for the purpose of minimizing stress due to difference in thermal expansion coefficients. Thus, the alumina layers 54 and 34 correspond to applicant's "boundary layer". See col. 6, line 50 to col. 8, line 38.

Applicant's claims differ by calling for the boundary layer to have an average sintered particle size larger than the average sintered particle size of the electrolyte layer and the insulating layer.

Art Unit: 1102

Suzuki discloses forming a more porous layer 4' with larger particles than a neighboring layer 4. See col. 2, lines 38-49.

It would have been obvious for Mase, in view of Suzuki, to employ particles in the alumina boundary layers 54 and 34 larger than the particles of its neighboring solid electrolyte layer and insulating layer so as to obtain an alumina boundary layer more porous than its neighboring layers. Using larger particles would be an efficient, easy way to ensure a higher porosity for the alumina boundary layer, and render it unnecessary for additional treatment to achieve the desired higher porosity.

In regard to claims 26 and 29, it would have been obvious to make Mase's ceramic layer 50 of alumina or spinel, because layer 50 borders heater 46. So as avoid current leakage from heater 46, ceramic layer 50 needs to be of an insulating material. Alumina and spinel are among the most common ceramic insulating materials known (see col. 6, line 53 of Mase) and each would have been an obviously desirable material for layer 50. Aside from the fact that alumina is inexpensive and readily available, making layer 50 of alumina would render it thermally compatible with the other alumina layers (20, 26, 34) of the sensor.

Applicant argues that Mase does not disclose a "boundary layer" between electrolytic and insulating layers.

It is unclear if applicant is alleging that Mase does not have any boundary layers at all, or that any boundary layer is not immediately between an electrolytic layer and an insulating layer. Neither argument is persuasive. First, applicant's claim language does not require a boundary

Art Unit: 1102

layer to be immediately between an electrolytic layer and an insulating layer. Second, layer 54 or 34 is made of alumina or spinel, the same material as that of applicant's boundary layer, and is more porous than its neighboring layers in order to minimize thermal stress (col. 6, lines 50-68). Whether the reference calls layer 54 or 34 a "boundary layer" is irrelevant, when such a layer clearly can function in the same manner as applicant's boundary layer.

Applicant also argues that layer 50 of the patent is not an insulating layer.

This argument is also not persuasive. Layer 50 is of a ceramic material and borders the heater element 46. In order to prevent current leakage from the heater, it is evident that layer 50 would be of an insulating material.

Applicant further argues that he has presented factual evidence to contradict the examiner's position that one of ordinary skill in the art would expect a relationship between sintered particle size and porosity.

This argument is further not persuasive. The two documents presented on appeal are not considered to support applicant's position, as discussed in detail in the examiner's answer. Those discussions still apply. The two new articles (Hamano et al and Yokota et al) are not seen to support applicant's position, as alluded to earlier in this action.

Applicant should note that at least as to claims 1, 2, 4, 6, 7, 10, 11, 18-22, they are identical to the claims affirmed on appeal, and the instant ground of rejection is identical to the ground of rejection presented on appeal. Thus, there is no basis for the examiner not to follow the decision of the Board.

Art Unit: 1102

Claims 24, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mase et al in view of Suzuki et al and Sugino et al 5,593,558 and Tatumoto et al 5,522,979.

These claims further differ by calling for the alumina boundary layer 54 and 34 to be made primarily of alpha-alumina with an average sintering particle diameter of 3-4 microns.

Sugino discloses an alumina layer in a solid electrolyte sensor comprising alpha-alumina. See col. 13, line 61. Tatumoto discloses alumina particles with a size of 2.3 microns, which is very close to applicant's 3 microns value. See col. 8, lines 35-40.

It would have been obvious for Mase to use alpha-alumina with a particle size of 3 microns for its alumina layers 54 and 34 in view of Sugino and Tatumoto, since the incorporation of known features from analogous prior art functioning as expected is within the skill of the art.

Claims 25, 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mase et al in view of Suzuki et al and Watanabe et al 4,370,393 or Ikezawa et al 4,421,787.

These claims further differ by calling for the electrolyte layer to be made of zirconia partially stabilized by yttria with an average sintering particle diameter of 2-3 microns.

Watanabe discloses yttria-stabilized zirconia to be a conventional solid electrolyte material. See col. 4, lines 25-29. Sample 22 in Table 1(c) shows a grain size of 3 microns. Ikezawa also discloses a conventional solid electrolyte of yttria-stabilized zirconia with a particle size of 0.5 to 8 microns. See col. 5, lines 21-41.

Art Unit: 1102


It would have been obvious for Mase to adopt a yttria-stabilized zirconia electrolyte with a particle size of 3-4 microns in view of Watanabe or Ikezawa, since the incorporation of known features from analogous prior art functioning as expected is within the skill of the art.

Claims 24, 25, 27-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 24 and 27, line 2, and claims 25 and 28, line 3, "centering" is not understood.
Does applicant mean --sintering--?

Claim 29, line 1, does applicant intend to depend this claim on claim 2?

The examiner can be reached at 703-308-3329. His supervisor Nam Nguyen can be reached at 703-308-3322. Any general inquiry should be directed to the receptionist at 703-308-0661. A fax number for TC 1700 is 703-872-9306.


Ta Tung

Primary Examiner

Art Unit 1753